भारतीय मानक
Indian Standard

IS 11660 : 2022

वस्त्र रंजक सामग्री — धनात्मक डाई-फिक्सिंग घटकों के मात्रात्मक आंकलन की विधि

(पहला पुनरीक्षण)

Textile Dyestuffs — Method for Quantitative Estimation of Cationic Dye-Fixing Agents

(First Revision)

ICS 59.040; 71.040.50

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भारतीय मानक ब्यूरो
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September 2022 **Price Group 3**

Textile Speciality Chemicals and Dyestuffs Sectional Committee, TXD 07

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Textile Speciality Chemicals and Dyestuffs Sectional Committee had been approved by the Textiles Division Council.

Cationic dye-fixing agents are used for after-treatment of direct or reactive dyeings to minimize the bleeding trouble. Many such agents available in the market are of different chemical nature andmay vary in active matter content. Assessment of active matter content is important to the manufacturer to standardize the product batches as well as to the user to evaluate cost/benefit ratio.

A number of methods are available for determining the active matter content. However, the method suggested should neither be too complicated nor be unsuitable for cationic compounds under consideration. Determination of solid content is not always a valid indication of active matter content as it can be adjusted by adding some other inactive, cheaper and compatible ingredient.

The method prescribed in this standard is based on titration of known volume of direct dye solution (Congo Red) against solution of the agent and comparing it with titration of cetrimide solution as a standard solution. The method is useful in estimating accurately the extent ofabsorption of dye-fixing agents by cotton under different conditions.

This standard was first published in 1986. The first revision has been made in the light of experience gained since its publication and to incorporate the following major changes:

a) Title of the standard has been modified;
b) Sampling clause has been modified; and
c) Grade and purity of chemicals used have been specified.

The composition of the Committee responsible for the formulation of this standard is given in Annex A.

In reporting the results of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’.

Indian Standard
TEXTILE DYESTUFFS — METHOD FOR QUANTITATIVE ESTIMATION OF CATIONIC DYE-FIXING AGENTS
(First Revision)

1 SCOPE

This standard prescribes a simple method for comparative estimation of active matter content of cationic dye-fixing agents. Lowest concentration of a commercial sample which can be estimated by this method is 0.2 ml/l.

2 PRINCIPLE

A known volume of dye (Congo Red) solution is titrated against the solution of cationic dye-fixing agent, the end point being indicated by complete precipitation of the dye. The volume of agent thus required is compared with that for a solution of known strength of standard solution of Cetrimide. Results are expressed as equivalent of cetrimide in the stock solution of the dye-fixing agent under test.

3 STANDARD AGENT SOLUTION

3.1 For the purpose of comparative estimation of dye-fixing agent under test, a standard solution (4g/litre) of cetrimide prepared by dissolving by 4 g of cetrimide (100 percent solid content) in 1000 ml of distilled water, shall be used.

4 APPARATUS

4.1 Titration Flask — 100 ml capacity.

4.2 Graduated Burette — with an accuracy of 0.1 ml.

4.3 Pipette — 20 ml capacity.

4.4 Weighing Balance — with an accuracy of 1 mg.

4.5 Whatman Filter Paper No. 41 or its Equivalent

4.6 Glass Rod — for spotting and stirring purposes.

5 REAGENTS

5.0 Quality of Reagents — Unless otherwise specified analytical reagent grade chemicals with 99.0 percent purity shall be employed in tests and distilled water (see IS 1070) shall be used where the use of water as reagent is intended.

5.1 Congo Red Direct Dye

5.2 Cetrimide with Known Strength (Solid Content)

6 PROCEDURE

6.1 Prepare 2 g/l Congo Red dye solution by dissolving accurately weighed 2 g dye in 50 ml of water and then making the final volume up to 1000 ml.

6.2 Prepare 4 ml/litre solution of the cationic dye-fixing agent under test by dissolving 4 ml of stock solution of the agent under test in 50 ml water and making the final volume up to 1 000 ml. Fill this solution in the burette up to the mark.

6.3 Pipette out 20 ml of Congo Red solution as prepared in **6.1** in the titrating flask.

6.4 Titrate the solution of the agent under test as prepared in **6.2** against Congo Red solution (**6.3**) till the end point is reached. End point is indicated by complete precipitation of dye present in the flask when by spotting a drop of solution on filter paper, dye appears as small specks in the spot with no coloured ring around. Note the volume of the solution of the agent under test required to achieve the end point.

6.5 Prepare 4 g/litre solution of standard cetrimide by dissolving x g of it in 50 ml distilled water (*see* Note) and making the final volume up to 1000 ml. Titrate this solution against 2 g/litre Congo Red solution similar to the procedure as given in **6.4** till the end point is reached. Note the volume of 4 g/litre cetrimide solution required to achieve the end point.

NOTE — The value of x can be calculated as follows:

$$x = \frac{4 \times 100}{y}$$

where

y = solid content of the cetrimide used.

7 CALCULATIONS

7.1 Calculate the active matter content in the stock solution of the cationic dye-fixing agent under test in terms of equivalent of cetrimide by the following formula:

$$C_a = \frac{V_c}{V_a}$$

Where

C_a = active matter content of the stock solutions of the agent under test as equivalent of cetrimide;

V_c = volume of the standard cetrimide solution (4g/litre) required to achieve the end point; and

V_a = volume of the solution (4 ml/litre) of the agent under test required to achieve the end point.

8 REPORT

8.1 Report the active matter content in the stock solution of the agent under test in terms of equivalent of cetrimide.

9 SAMPLING

9.1 Lot — All the containers of the same cationic dye fixing agent of same composition delivered to a buyer against one dispatch note shall constitute a lot.

9.2 Unless otherwise agreed to between the buyer and the seller, the number of containers to be selected at random from a lot shall be as given below:

Table 1 Sample Size

(*Clause* 9.2)

Lot Size (1)	**Sample Size** (2)
2 to 15	2
16 to 25	3
26 to 50	4
51 to 100	5
101 to 150	6
151 to 300	7
301 and above	8

9.3 Stir the contents of the containers as selected in **9.2**, thoroughly for not less than five minutes with a clean stick to make them homogeneous. Draw a sample of about 10 g from each selected container in a clean bottle and mix thoroughly. This shall constitute the test sample. The test sample should be stirred again with a clean glass rod before testing.

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

Textile Speciality Chemicals and Dyestuffs Sectional Committee,
TXD 07

Organization	*Representative(s)*
Department for Jute and Fibre Technology Institute of Jute Technology, University of Calcutta, Kolkata	Prof A K Samanta (***Chairman***)
Ahmedabad Textile Industry's Research Association,	Shrimati Deepali Plawat Shrimati Fahimunnisa Khatib (*Alternate*)
Ama Herbals Laboratories Pvt Ltd, Lucknow	Shri Y A Shah
Archroma India Pvt Limited, Mumbai	Shri Rajesh Ramamurthy Shri Ashim Ghosh (*Alternate*)
Atul Limited (Colors Business), Valsad	Shri V R Sai Ganesh Shri Arindam Chakraborty (*Alternate*)
Bio Dyes India Pvt Ltd, Goa	Dr Bosco Henriques
Central Coir Research Institute, Alappuzha	Shrimati Anita Jacob Shrimati Sumi Sabestian (*Alternate*)
ICAR – Central Institute for Research on Cotton Technology, Mumbai	Dr Sujata Saxena Dr A S M Raja (*Alternate*)
Department for Jute and Fibre Technology Institute of Jute Technology, University of Calcutta, Kolkata	Dr D Das
Global Organic Textile Standard, (GOTS), Thane	Shri Rahul Bhajekar Ms Prachi Gupta (*Alternate*)
Indian Jute Industries Research Association, Kolkata	Dr S K Chakrabarti Shri Sandip Basu (*Alternate*)
Northern India Textile Research Association, Ghaziabad	Dr M S Parmar
Office of the Textile Commissioner, Mumbai	Shri Gaurav Gupta Shri Sanjay Charak (*Alternate*)
SGS India Pvt Ltd, Mumbai	Shri Karthikeyan K Shri Gaurav Saraswat (*Alternate*)
Shree Pushkar Chemicals & Fertilizers Ltd, Mumbai	Dr N N Mahapatra
Textiles Committee, Mumbai	Shri Kartikeya Dhanda Shrimati Shilpi Chauhan (*Alternate*)

Organization	*Representative(s)*
The Arvind Mills Limited, Ahmedabad	SHRI RAJARSHI GHOSH SHRI UMASANKAR MAHAPATRA (*Alternate*)
The Bombay Textile Research Association, Mumbai	DR PADMA S VANKAR SHRI M P SATHIANARAYANAN (*Alternate*)
The South India Textile Research Association, Coimbatore	DR PRAKASH VASUDEVAN SHRI S SIVAKUMAR (*Alternate*)
The Synthetic and Art Silk Mills Research Association, Mumbai	SHRIMATI (DR) MANISHA MATHUR SHRIMATI ASHWINI SUDAM (*Alternate*)
U P Textile Technology Institute, Kanpur	DR ARUN PATRA
Wool Research Association, Thane	SHRIMATI SMITA BAIT SHRIMATI (DR) MRINAL CHOUDHARI (*Alternate*)
BIS Directorate General	SHRI J K GUPTA, Scientist E and Head (Textiles) [Representing Director General (*Ex-officio*)]

Member Secretary
SHRI HIMANSHU SHUKLA
Scientist B (Textiles), BIS

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Review of Indian Standards

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